BST-75 OPERATOR'S MANUAL (72-76 MHz)

Synthesized Base Station Transmitter

COMTEK®

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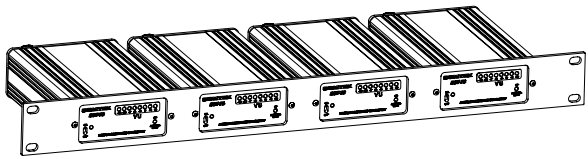
INTRODUCTION

BST-75

Synthesized Base Station Transmitter



The BST-75 mini base station transmitter meets the highest professional standards while offering outstanding value and the most advanced technology available. This versatile and innovative transmitter is simple to use, yet it has sophisticated features such as "Flash Memory" 98-channel programmability with synthesized manual 10-channel selectable user-switch. Plus a unique multi-function R.F. indicator detects bad antenna load, RF presence, coaxial cable short or open condition for quick and easy trouble-shooting.

The compact design of this transmitter is ideal for multiple transmitter installations. Up to four transmitters can be installed in one rack space. Also, it operates in the 72-76 MHz band under FCC Regulation Part 90. This allows a greater RF power capability (120 mW) for greater range and reliability than customary FCC Part 15 systems.

The audio processing circuit produces full fidelity frequency response from 80 Hz to 10 kHz with very low residual F.M. noise and distortion. To accommodate a greater variety of receivers, the BST-75 can operate with non-companded receivers or with companded receivers for higher fidelity sound reproduction with a signal-to-noise ratio of up to 100 dB.

All this is designed into a stylish, compact, all-metal enclosure suitable for permanent rack-mount installations or can be battery powered for stand-alone portable applications.

OPERATING INSTRUCTIONS

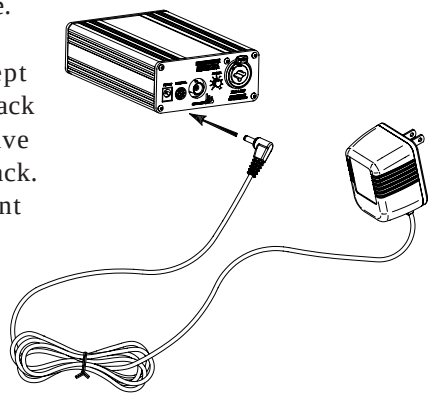
Equipment Placement

If the BST-75 base station is to be rack mounted, a remote antenna must be used. The base station should be mounted away from equipment that uses large power transformers to reduce 60 Hz hum possibilities.

Special Note: When using the base station in close proximity to other audio equipment, ensure that the audio equipment is not susceptible to RF interference. This can be accomplished by temporarily installing the base station as per above, and then while the base station is operating, checking all audio outputs for uncharacteristic noise. If a problem is found, move the base station or the remote antenna as far as possible from the affected equipment. Should you continue to have problems, contact COMTEK's Technical Support Services for assistance.

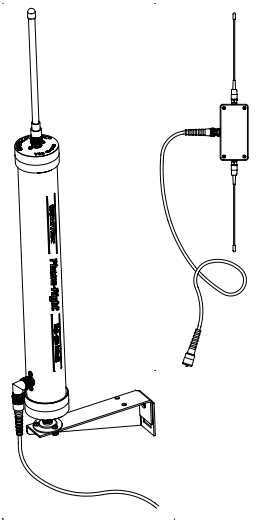
Power Requirements

The BST-75 base station is designed to be powered by 12 volts AC through a standard barrel type power jack (5.5mm X 2.1mm). The AC power adaptor supplied (AP-12VAC) is used for permanent installations and mobile applications where AC power is available. For field operation only, the BST-75 base station will accept 12V DC through the power jack with either positive or negative 12V to the center pin of the jack. The on / off switch on the front panel of the base station transmitter should be turned to the "off" position when the power plug is initially plugged into the transmitter.



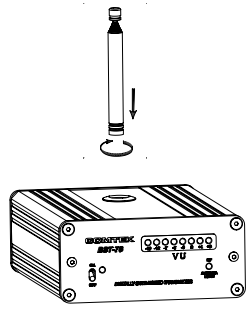
OPERATING INSTRUCTIONS

Remote Antenna



When the BST-75 base station transmitter is to be rack mounted for permanent installation, a remote antenna must be used. The RDA-2B remote dipole antenna (or equivalent) or the COMTEK "Phase Right Antenna" PRA-L72 high performance omni antenna should be used. These antennas must be placed vertically polarized up to twenty feet away from the transmitter with the coaxial cable supplied. The highest possible antenna placement away from any metallic object is best. For high gain directional yagi type antennas and specialty antennas, contact COMTEK's Technical Support Services.

Integral Screw-in Whip Antenna



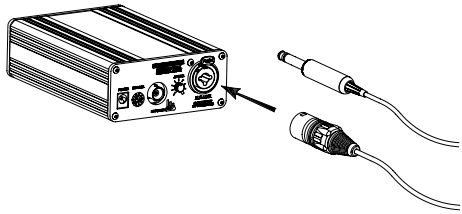
If the BST-75 base station transmitter is to be used outside of the traditional rack-mounted environment for stand-alone mobile type applications, the screw-in whip antenna (TWA-75) should be used. The transmitter should be placed on a table or platform as high as possible so the fully extended whip antenna is at least 24" away from any metallic object. The radiated output power of the transmitter with this whip antenna will not be as great as the remote antennas. The BST-75 transmitter should only be used in the high power setting when the telescoping whip antenna is used.

OPERATING INSTRUCTIONS

Audio Input Connections

The BST 75-216 base station transmitter uses an XLR-3F connector with a "Combo" phone jack. The XLR portion of the connector will accept a true balanced or unbalanced line level signal up to +20 dBm. The 1/4" mono jack portion of the connector can be used for AUX level audio or line level audio up to +5 dBm. It also can be used to directly phantom-power most two-conductor electret headset microphones.

Note: *For best performance, the 1/4" mono jack should be considered the primary choice for shorter audio line feed.*



Audio Adjustments

In order to ensure the highest possible transmission fidelity, the transmitter must be modulating at least 50% with normal speech (0 dB on the VU meter). This adjustment is made in the following manner:

a. Ensure that the audio source has been optimized for best signal-to-noise ratio.

b. The XLR-3 connector located on the back of the transmitter is used for line level balanced or unbalanced audio source (up to +20 dBm).

c. Set the AF Gain Control on the back of the base station to fully counterclockwise. Then, while normal program information is present, slowly rotate the "LEVEL" control clockwise until the VU meter on the front panel begins to deflect. Adjustment should be made so that normal speech or music deflects the 0 dB yellow LED. Only peak level of speech or music should deflect the VU meter full-scale into the last red LED.

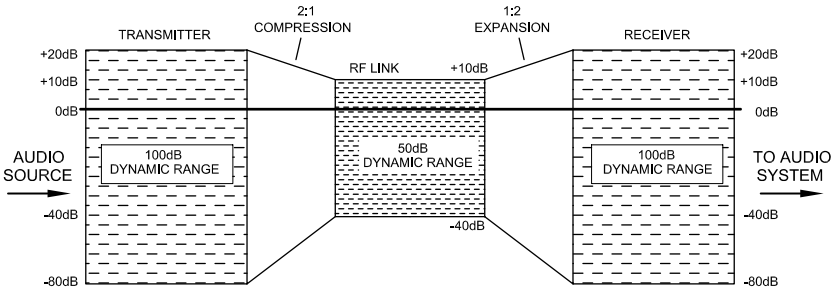
Audio Processing Circuit

The audio processing system incorporates a peak-level compressor to prevent over-modulation and reduce audio distortion at high levels. This compressor has a very fast attack time and a carefully controlled decay time to optimize the dynamic performance of the audio processing system. (The VU meter will indicate this compressor action when the red LEDs are illuminated.) The audio is also equalized to add pre-emphasis as well as a very sharp high frequency roll-off circuit to minimize high frequency noise in the audio signal. The total frequency response and performance of the system is, however, determined by the corresponding de-emphasis and equalization used in the receiver.

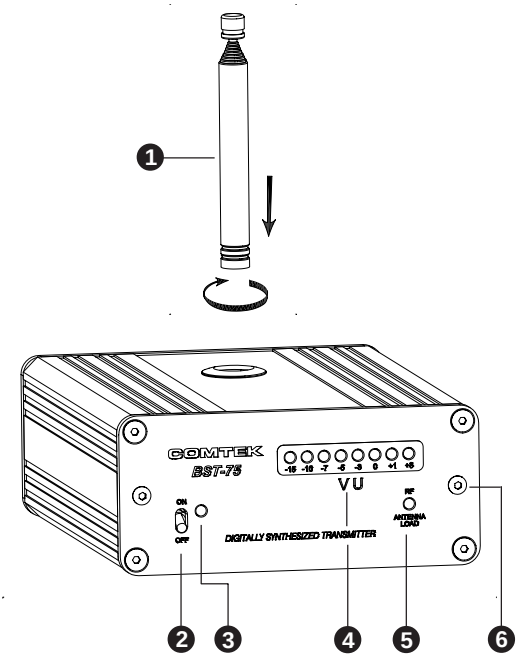
In order to accommodate a greater variety of receivers, the BST-75 transmitter incorporates the option to operate with receivers that have companded or non-companded audio processing. However, the BST-75 transmitter must operate non-companded with non-companded receivers and companded only with receivers that incorporate companding processing. A mismatch will result in unacceptable audio performance.

Basic Companding Theory

The dynamic range of the audio signal is compressed in the transmitter at a 2:1 ratio. The receiver then expands the audio signal at a complementary 1:2 ratio to restore the dynamic range of the audio signal to the original level and also to provide additional noise reduction when no audio signal is present.



BST-75 FRONT PANEL



❶ **OPTIONAL ANTENNA:** Used for mobile type applications.

❷ **POWER SWITCH:** Turns the transmitter on or off.

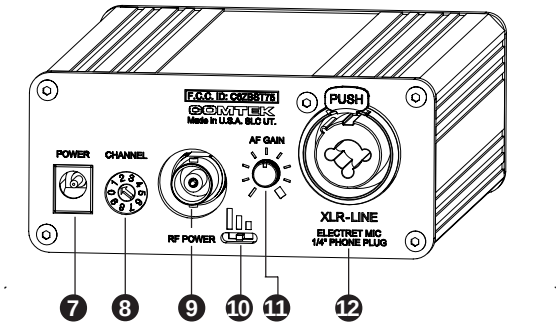
❸ **POWER LED INDICATOR:** Illuminates when the power is on.

❹ **VU METER:** Displays the audio level being used for modulation. (See Audio Adjustment Section.)

❺ **ANTENNA INDICATOR:** Flashes when transmitter detects coaxial cable shorts and open conditions, bad antenna load.

❻ **RACK-MOUNTING SCREWS:** Used for mounting BST-75 to rack-mounting panels.

BST-75 REAR PANEL



7 POWER INPUT JACK: Requires 12V AC at 200 mA. Will also accept 12V DC with either positive or negative center pin (for field operation only).

8 CHANNEL SELECTOR SWITCH: Selects the frequency on which the transmitter will operate. (See Frequency Information Section.)

9 EXTERNAL ANTENNA JACK: BNC connector provides a standard 50 ohm RF output for use with an external antenna.

10 RF POWER SWITCH: Adjusts the RF power output of the transmitter (High-120mW, Mid-40mW, Low-10mW).

11 AUDIO LEVEL CONTROL: This control is used to set the proper modulation level when referenced with the VU meter.

12 MIC / LINE AUDIO INPUT: XLR-3 accepts balanced line level input. 1/4" phone jack accepts 2-conductor electret microphone type only.

BST-75 FREQUENCY INFORMATION

USER-SWITCHABLE STANDARD CHANNELS NON-COMPANDED

CHANNEL	FREQUENCY
A #1	72.1 MHz
B #2	72.3 MHz
C #3	72.5 MHz
D #4	72.7 MHz
E #5	72.9 MHz
F #6	75.5 MHz
G #7	75.7 MHz
H #8	75.9 MHz
I #9	74.7 MHz
J #10	75.3 MHz

GROUP FREQUENCY CHART GROUP 1

CHANNEL	FREQUENCY
A #1	72.1 MHz
E #5	72.9 MHz
H #8	75.9 MHz
J #10	75.3 MHz

GROUP FREQUENCY CHART GROUP 2

CHANNEL	FREQUENCY
B #2	72.3 MHz
G #7	75.7 MHz
I #9	74.7 MHz

GROUP FREQUENCY CHART GROUP 3

CHANNEL	FREQUENCY
C #3	72.5 MHz
F #6	75.5 MHz

AVAILABLE 72-76 MHz "FLASH MEMORY" COMPANDED CHANNELS

CHAN	FREQ
01	72.02 MHz
02	72.04 MHz
03	72.06 MHz
04	72.08 MHz
05	72.10 MHz
06	72.12 MHz
07	72.14 MHz
08	72.16 MHz
09	72.18 MHz
10	72.20 MHz
11	72.22 MHz
12	72.24 MHz
13	72.26 MHz
14	72.28 MHz
15	72.30 MHz
16	72.32 MHz
17	72.34 MHz
18	72.36 MHz
19	72.38 MHz
20	72.40 MHz
21	72.42 MHz
22	72.46 MHz
23	72.50 MHz
24	72.54 MHz
25	72.58 MHz
26	72.62 MHz
27	72.64 MHz
28	72.66 MHz
29	72.68 MHz
30	72.70 MHz
31	72.72 MHz
32	72.74 MHz
33	72.76 MHz
34	72.78 MHz

CHAN	FREQ
35	72.80 MHz
36	72.82 MHz
37	72.84 MHz
38	72.86 MHz
39	72.88 MHz
40	72.90 MHz
41	72.92 MHz
42	72.94 MHz
43	72.96 MHz
44	72.98 MHz
45	74.61 MHz
46	74.63 MHz
47	74.65 MHz
48	74.67 MHz
49	74.69 MHz
50	74.71 MHz
51	74.73 MHz
52	74.75 MHz
53	74.77 MHz
54	74.79 MHz
55	75.21 MHz
56	75.23 MHz
57	75.25 MHz
58	75.27 MHz
59	75.29 MHz
60	75.31 MHz
61	75.33 MHz
62	75.35 MHz
63	75.37 MHz
64	75.39 MHz
65	75.42MHz
66	75.46 MHz
67	75.50 MHz
68	75.54 MHz

CHAN	FREQ
69	75.58 MHz
70	75.62 MHz
71	75.64 MHz
72	75.66 MHz
73	75.68 MHz
74	75.70 MHz
75	75.72 MHz
76	75.74 MHz
77	75.76 MHz
78	75.78 MHz
79	75.80 MHz
80	75.82 MHz
81	75.84 MHz
82	75.86 MHz
83	75.88 MHz
84	75.90 MHz
85	75.92 MHz
86	75.94 MHz
87	75.96 MHz
88	75.98 MHz

GROUP FREQUENCY CHARTS

GROUP 1

CHAN	FREQ
01	72.02 MHz
11	72.22 MHz
31	72.72 MHz
45	74.61 MHz
70	75.62 MHz
75	75.72 MHz

GROUP 2

CHAN	FREQ
04	72.08 MHz
09	72.18 MHz
31	72.72 MHz
53	74.77 MHz
69	75.58 MHz
85	75.92 MHz

GROUP 3

CHAN	FREQ
13	72.26 MHz
25	72.58 MHz
54	74.79 MHz
57	75.25 MHz
81	75.84 MHz
87	75.96 MHz

BST-75 FREQUENCY INFORMATION

Frequency Selection

The BST-75 transmitter comes from the factory on 10 standard manually selectable channels. Other group frequencies are available from the 88 "Flash Memory" programmable channel list and have been coordinated for simultaneous operation. These group frequencies can be programmed for use with the manual 10-channel selectable user-switch. Frequency coordination and after-sale programming for different compatible frequency groups can be done through COMTEK's Technical Support Services. ***Frequency selection software may be downloaded from COMTEK's website at www.comtek/software.html***

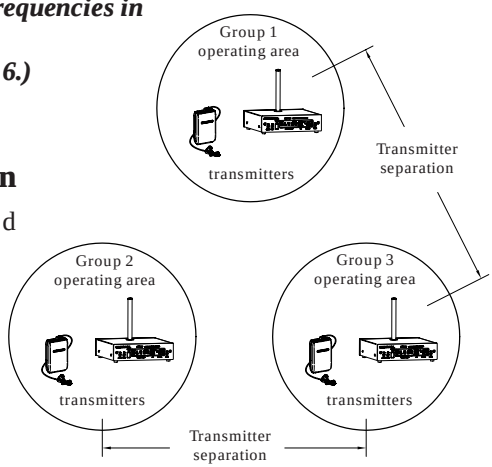
Multiple Channel Operation

When multiple transmitters (more than two) are used in the same proximity, intermodulation interference can occur. This condition is common to all radio receivers to some extent when multiple transmitters are used in the same operating area. The RF signals will "MIX" together generating additional signals. If these product frequencies are too close to a frequency which the receiver can also respond to, you will experience intermodulation interference which may cause undesirable operation.

To avoid this type of interference when multiple transmitters are used in the same proximity, transmitting frequencies must be coordinated by selecting from frequencies in the same group.
(See group frequency chart on page 6.)

Transmitter Proximities For Multiple Channel Operation

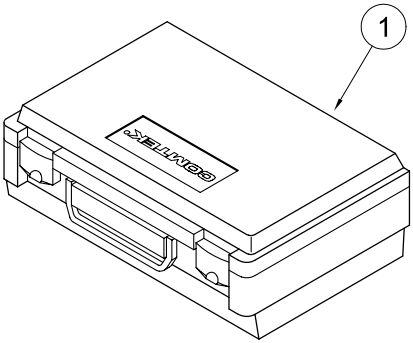
Frequency groups being transmitted should be separated by 2X the operating area; and for best performance, the group operating areas should have a 100 ft. minimum separation.



BST-75 ACCESSORIES

Included Accessories

1. C-75 Carrying case

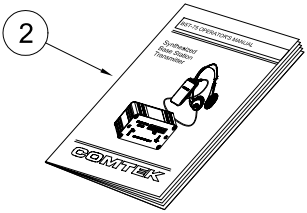


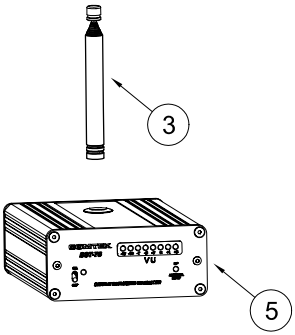
2. BST-75 Operator's manual

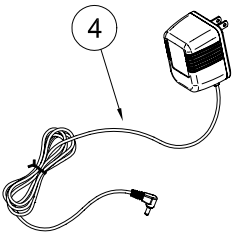
3. TWA-75 Telescoping whip antenna

4. AP-12VAC Power adaptor (115V AC Input)

5. BST-75 Base station transmitter







BST-75 ACCESSORIES

Optional Accessories

1. RDA-2B Remote dipole antenna

2. PRA Phase-Right coaxial antenna

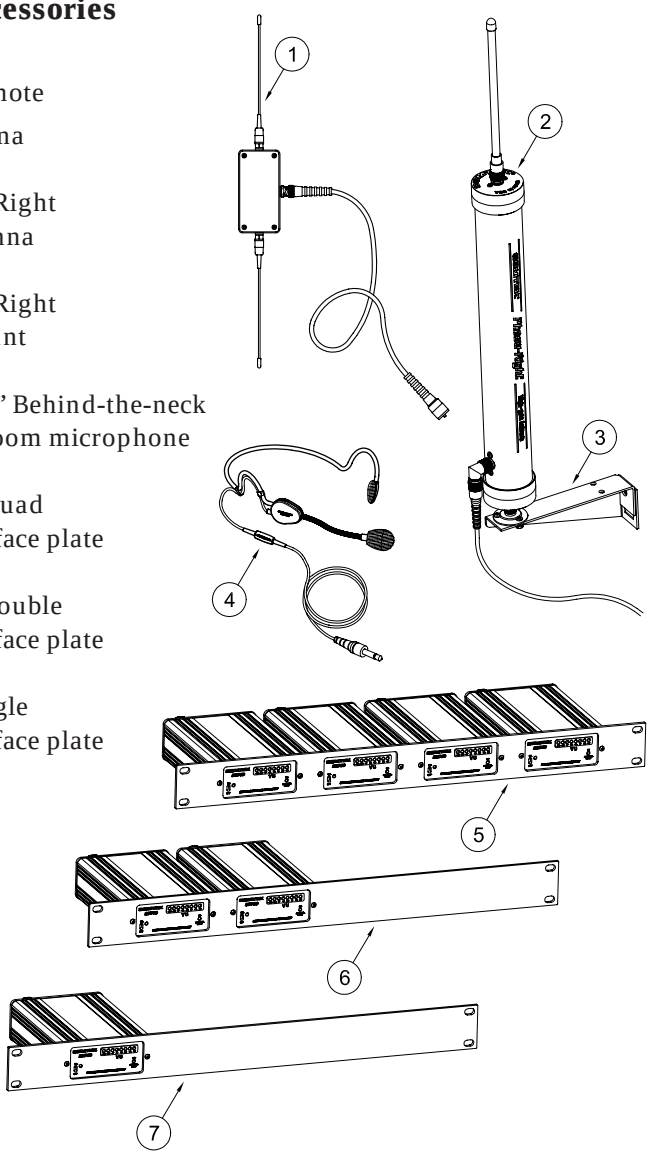
3. PRA Phase-Right antenna mount

4. HM-100 1/4" Behind-the-neck directional boom microphone

5. RMK 75-4 Quad rack-mount face plate

6. RMK 75-2 Double rack-mount face plate

7. RMK 75 Single rack-mount face plate



BST-75 SPECIFICATIONS

Audio Inputs:
- Line level balanced input 0 dBm for 80% modulation (+20 dBm max, XLR-3F)
- Unbalanced input (+5 dBm Max) or two wire electret microphone with bias voltage for electret microphone (-35 dBv at 5 K ohms) with 1/4" phone jack.

Connectors:
- XLR-3F Combo with 1/4" phone jack
- Barrel type 5.5mm X 2.1mm power jack AC or DC
- BNC type RF output

Operation Indicators:
- LED bargraph VU meter
- LED antenna load and coaxial cable condition indicator
- LED DC power indicator

Antenna:
- 19" Telescopic antenna mounts directly into top of transmitter
- BNC RF output connector for optional external antenna

FCC Compliance:
Type Accepted under FCC Part 90

Power Requirements:
12 Volts AC or DC, 200 mA max

Frequency Response:
80 Hz to 10 kHz

Audio Distortion:
Less than 0.5% at 80% modulation

Modulation Limiter:
Peak compressor type with high linear overload protection (25 dB). Attack time less than 1 ms, recovery time 10 ms

Audio Processing:
Companded and non-companded to accommodate a variety of receivers

Audio Gain Control:
Limited to 20 dB

Frequency Modulation:
10 kHz deviation for narrow band companded

RF Output Power:
Maximum power output for FCC Part 90 (120mW)

Frequency Stability:
Better than 0.002% digitally synthesized, crystal controlled

Operating Frequency:
72.020 to 75.980 MHz
88 "Flash Memory" programmable channels

Harmonic and Spurious Emissions:
Better than 50 dB below carrier

Dimensions:
$3\frac{3}{4}$" X $1\frac{5}{8}$" X $5\frac{1}{4}$" deep

Weight:
$15\frac{1}{4}$ oz.

NOTE: Specifications subject to change without notice

WARRANTY AND SERVICE

Warranty

COMTEK transmitters and receivers are warranted to be free from defects in workmanship and material under normal stand-alone use and conditions for a period of **two years** from date of original purchase. Items such as headphones, earphones, neckloops, and cords are warranted to be free from defects in workmanship and material for a period of 90 days from the date of original purchase. Batteries are not covered by this warranty. Damage due to abnormal use, extreme conditions, misuse, use of the product as a component of another product, ill treatment and unauthorized modification and repairs are not covered by this warranty. COMTEK is not liable for any consequential or punitive damages arising out of any failure of the equipment to perform as intended. COMTEK shall bear no responsibility or obligation with respect to the manner of use of any equipment sold by it. COMTEK SPECIFICALLY DISCLAIMS AND NEGATES ANY WARRANTY OF MERCHANTABILITY OR FITNESS OF THE PRODUCT FOR A PARTICULAR PURPOSE INCLUDING, WITHOUT LIMITATION, ANY WARRANTY THAT THE USE OF SUCH EQUIPMENT FOR ANY PURPOSE WILL COMPLY WITH APPLICABLE LAWS AND REGULATIONS.

Service Policy

Warranty repairs must be done by COMTEK. Only factory technicians are authorized to perform warranty service on the BST-75 transmitter. Before returning the BST-75 for service, a Return Authorization Number should be obtained from the service department by calling 1-800-496-3463 or 1-801-466-3463. Return the unit to the factory with the original or comparable packing. COMTEK will pay for insurance and ground return shipping costs in the United States for all warranty service.

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